

Safety Training Course of Construction Workers of Specified Trade

Construction Materials Rigger (AS12)

Key Points

Version: 2023-11



1. Introduction – Rigging and Lifting Operation

1. Rigging means the proper arrangement of heavy objects pushed and placed securely, tied with rope / steel rope into a solid whole, plus a sling or sling chain securely into the crane's hook waiting for the lifting operation. If loose (fragmented) goods should be properly placed in a properly inspected container (e.g. hanger) that has been inspected and marked with a safety operating load (SWL)
2. Lifting means lifting a crane including a tower crane, a mobile crane, etc., to lift the heavy object to another construction site, or lifting it from a low to a high place or being lowered from a height to a low place.
3. As the crane operator can operate the crane only, in individual cases, can not take into account the heavy load rigging (e.g. tower crane operation), so to set up a rigger for rigging, and the banksman with the crane operator and rigger communication between the coordination of boom / hook / sling movement / lifting related operations.

1. Introduction – Common Causes for Lifting Accident

4. The lifting site should be equipped with a protective fence to indicate the danger of lifting range and prevent other personnel from entering the danger range.
5. This shows that the importance of the duties of rigger and banksman is therefore necessary for both to have knowledge of the "safe use of lifting gear" and "the crane number / walkie-talkie" and have received relevant internship training.

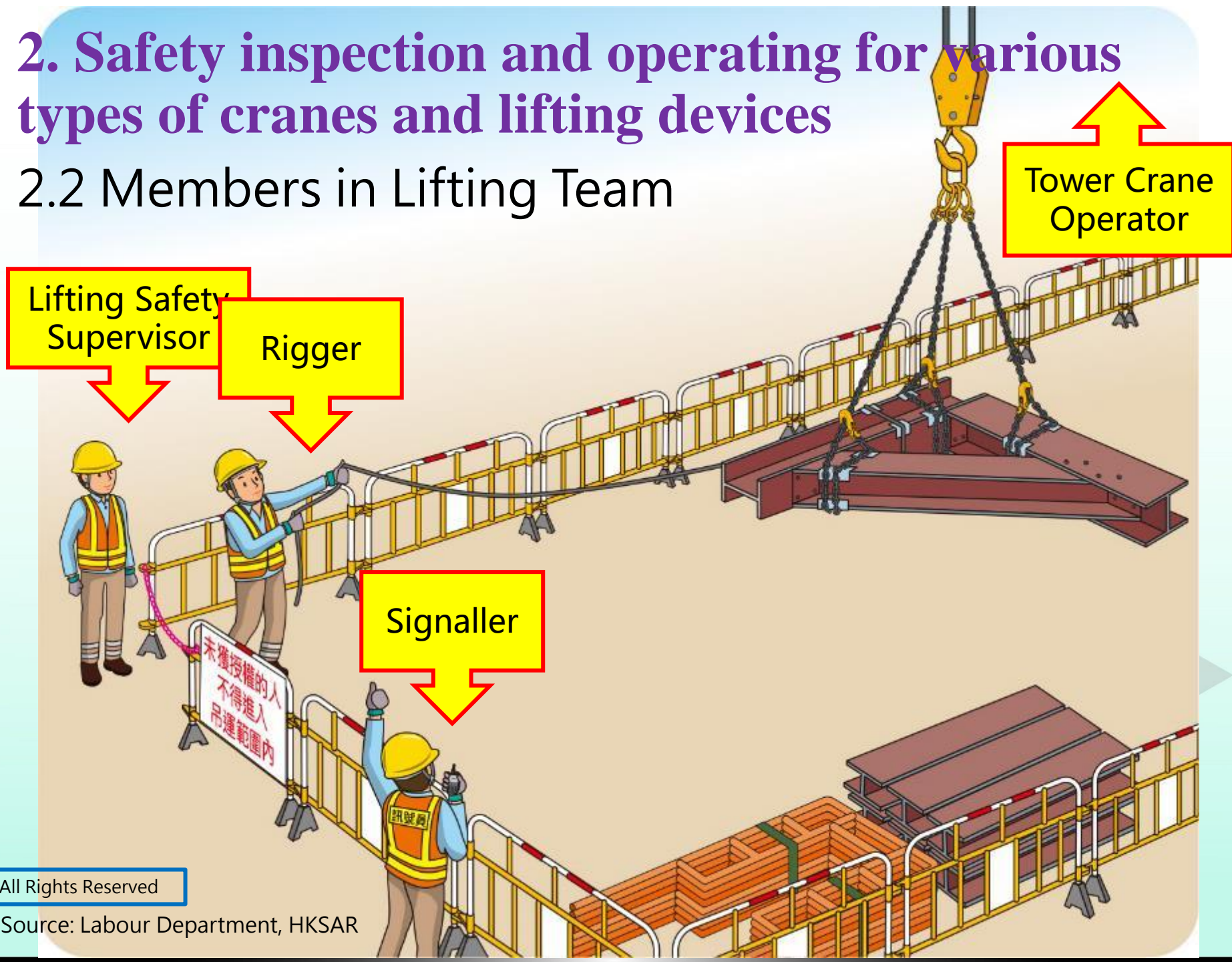
2. Safety inspection and operating for various types of cranes and lifting devices

(A) Safety checks




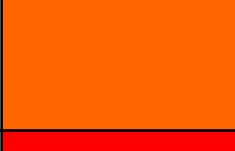
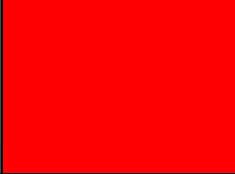

1. Cranes and lifting devices must be checked regularly, otherwise they cannot be ensured for safety and reliability. Regular inspections are particularly important as they can be detected early for potential hazards that may lead to accidents and preventive repairs that require advance warning. In the absence of the required repairs, the crane or lifting equipment can be severely depleted and expensive replacement or repair costs are required.
2. Inspection refers to the visual and physical inspection, usually supplemented by functional inspection, to check the condition of cranes or lifting devices of individual components. The purpose of the inspection is to find out if the component has abnormal wear, fault, oil leakage, overheating, corrosion, unusual noise, shift, dislocation, seeable cracks, overload, abnormal loosening or elongation, excessive shock, etc. If necessary, even stop using the relevant crane or lifting device.
3. The key items for regular inspection include: Number and scope of inspections, the ability of the person participating in the inspection, and reports of eligible persons.

2. Safety inspection and operating for various types of cranes and lifting devices

2.2 Members in Lifting Team



Color Marking System for lifting tools (Government Site)

Jan – Mar	BLUE	
Apr – Jun	YELLOW	
Jul – Sept	GREEN	
Oct – Dec	ORANGE	
to be removed from the site	RED	
equipment awaiting for inspection	WHITE	

3. General Duties Provisions



3.1 Signaller

Where the crane operator of the crane does not have a clear and unrestricted view of the load carried by the crane or the point of attachment for a load where no load is being carried and such view is necessary for the safe working of the crane, **a signaller shall be employed to relay the slinger's instructions to the crane operator** (Regulation 15B(1) of the LALGR).

The signaller should be responsible for relaying the signal from the slinger to the crane operator. He is also responsible for directing the safe movement of the crane. In particular, he should:

- a. have attained the age of 18 years;
- b. be fit with particular regard to eyesight, hearing and reflexes;
- c. understand the signal code and be able to transmit the instructions of the slinger in a clear and precise manner; and
- d. be easily identifiable to the crane operator (e.g. by wearing 'high-visibility' clothing, or other means).

3. General Duties Provisions

3.2 Slinger

The slinger should be responsible for attaching and detaching the load to and from the crane, and for the use of correct lifting gear in accordance with the planning of the operation. In particular, the slinger should:

- a. have attained the age of 18 years;
- b. be fit with particular regard to eyesight, hearing and reflexes;
- c. be agile and have the physique to enable him to handle lifting tackle;
- d. have been trained in the general principles of slinging and be able to establish weights and judge distances, heights and clearances;
- e. be capable of selecting tackle and lifting gear as well as rigging method suitable for the loads to be lifted;
- f. understand the signal code shown in Table 1 and be able to give clear and precise signals;

3. Basic lifting safety measures

1. Recognize the categories and construction of lifting tools.
2. Personal protective equipment (e.g. hard hats, safety shoes, protective gloves) should be worn prior to daily work.
3. It is important to be aware of the “Safe Working Load” (SWL) of lifting appliance and lifting gears.
4. Before lifting, know the weight of the load in order to select the appropriate lifting gear.
5. The slinger shall ensure that the sling used has a valid examination certificate and is engraved with the sling number and is responsible for using it in mind.

3. Basic lifting safety measures (Cont'd)

6. Check whether the crane hook is equipped with an insurance or steel rope hook insurance, to ensure in safe working order.
7. Loose materials should be properly placed in a suitable receptacle after passing the inspection (the carrier should have been inspected and engraved with a safe operating load SWL).
8. Pay attention to the weight of the load to maintain a balance, to ensure that the weight is evenly distributed, to avoid one side of the sling to withstand excessive load force.
9. When using two pairs of slings, the angle between the slings must not exceed 90° .
10. Do not stand under the boom or under load and within the swing range when lifting.

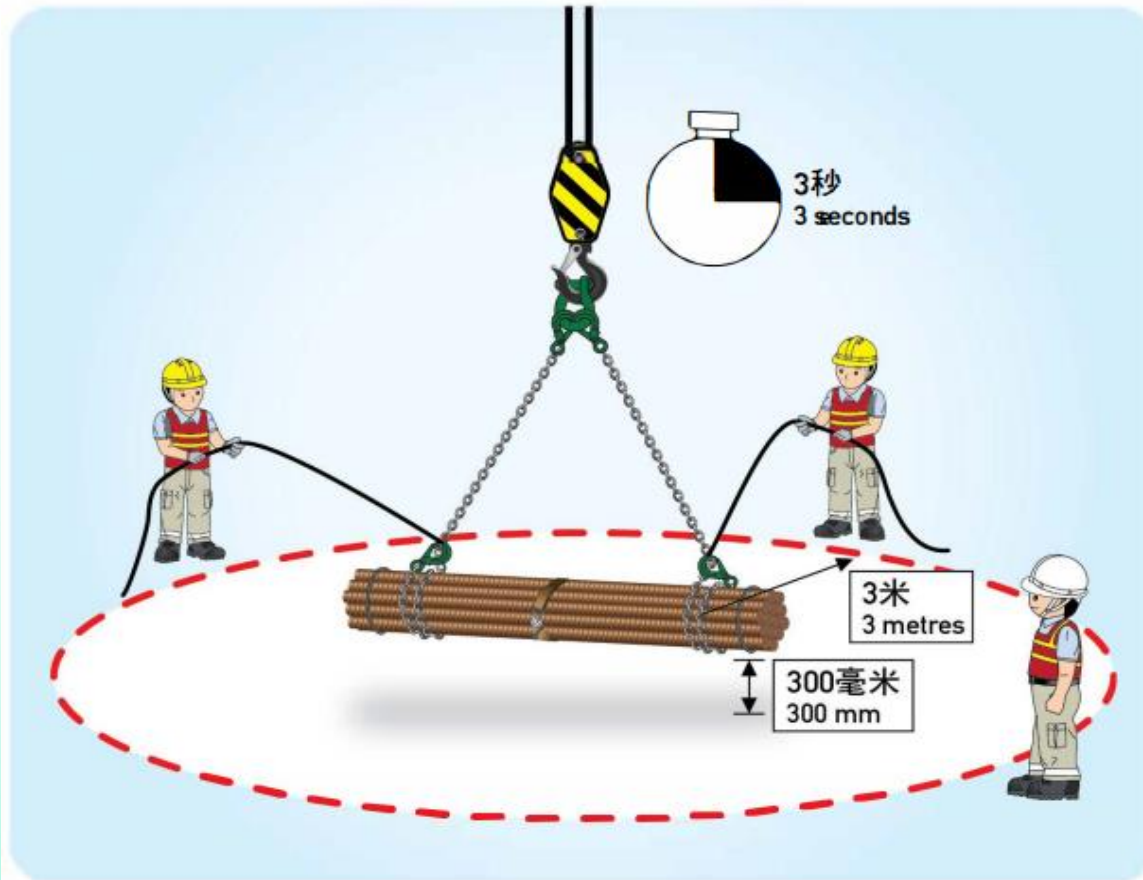
3. Basic lifting safety measures (Cont'd)

11. Pay attention to whether the lifting material stacking area is safe.
12. When hanging a sling or sling is attached, use a shackle or ring with a valid certificate.
13. Have sufficient knowledge to know the angle of the sling, the sling chain in use, the crane will change the load force accordingly (see sling chain, sling angle and load chart). The angle of the sling and the sling should not be greater than 120° (preferably within 90°). Other tools (e.g. gantry hangers) can be used if required.
14. Do not use webbing slings when lifting with a sharp edge objects.

3. Basic lifting safety measures (Cont'd)

15. When lifting a longer object, avoid the use of a single sling, should be two sides with a tail rope, free of suspension swing, not with a crane to pull (drag) the load.
16. Implementation of lifting 3-3-3 (i.e. heavy objects off the ground 300mm, test hanging 3 seconds, clearing 3 meters).
17. When handling a crane that is prone to wear ropes, be protected with a protective pad.
18. Slings in a spiral twisting state should not be used.
19. Do not throw slings and slings from high places.
20. In addition to the lower sling, sling before, should pay attention to whether the load is stopped and stable.

3. Basic lifting safety measures (Cont'd)



Safe lifting "3, 3, 3" is a hold point of lifting procedure before lifting, which can effectively improve the safety of lifting operation:

- Keep 3m away from materials being lifted;
- Lift up the materials 300mm from ground; and
- Wait for 3 seconds for stabilizing the lifting object before lifting operation.

4. Basic lifting safety measures (Cont'd)

21. Before removal and installation, the contingency method in the event of a hazardous situation should be considered in advance.
22. The safety of the crane / heavy object from its own distance should always be taken into account at the site. Don't stand at "dead spot" during lifting, make sure that others stay away from the lifting zone.
23. The lifting gear after use must be stored properly.

5. Standard Rigging Operation

Material	LG to be used	Rigging Method
Metal Scaffold Materials	<ul style="list-style-type: none">• 4-Legged Chain Sling	<ul style="list-style-type: none">• Lifting Tap Line x 2
Wooden Timbers	<ul style="list-style-type: none">• Webbing sling x 2• Shackle x 3	<ul style="list-style-type: none">• Tightening Strap• Lifting Tap Line x 2
Rebars	<ul style="list-style-type: none">• 2-Legged Chain Sling	<ul style="list-style-type: none">• Lifting Tap Line x 2

5. Standard Rigging Operation

Material	LG to be used	Rigging Method
I-beam	<ul style="list-style-type: none">• 2-Legged Chain Sling	<ul style="list-style-type: none">• Stabilizing Strap x 2• Lifting Tap Line x 2
Metal Tubes	<ul style="list-style-type: none">• Lifting Wires x 2• Shackles x 3	<ul style="list-style-type: none">• Tightening Strap• Stabilizing Strap x 2• Lifting Tap Line x 2
Steel Plates	<ul style="list-style-type: none">• Lifting Wires x 2• Shackles x 3	<ul style="list-style-type: none">• Soft Pads x 2• Stabilizing Strap• Lifting Tap Line x 2

6. Introduction to Smart Site Safety System

Requirements for Technical Circular from Development Bureau

- Works contracts with estimated contract sum exceeding \$30 million to adopt SSSS in early 2023;
- All capital works contracts with an estimated contract sum exceeding \$30 million to be tendered on or after the date of this Circular shall adopt SSSS;
- For existing capital works contracts with a contract sum exceeding \$30 million, the project teams, with advice from the Departmental Safety and Environmental Advisor (“DSEA”), are strongly recommended to issue variation orders or Project Manager/Service Manager Instructions for adopting SSSS , pursuant to the established mechanism and administrative procedures

6. Introduction to SSSS Equipment

Safety Alert to Unauthorized Entry to Plant Operating Zone

- Installing automatic warning system to alert operators any entry to plant operating zone to reduce risk of being hit or ran over by machine ;
- The flashing light and warning sound will be triggered to alert unauthorized entry to danger zone.



Fatal Zone



CONSTRUCTION
INDUSTRY COUNCIL
建造業議會

會



生命第一
LIFE FIRST



對危險說**不**

SAY **NO** TO DANGER

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